

## FRAME COVERAGE RESULTS: MT 2013

S Williams 9/15/13

From June 1 to September 1, 2013, the Montana Sampling Frame Coverage Study was implemented to estimate the coverage of the licensure List used as the sampling frame for the SYNAR inspection survey. Exhibit 1 provides a summary of the study results. The estimated coverage of 97 percent exceeds the desired 90 percent and the 80 percent minimum coverage for the inspection survey.

As shown in Exhibit 1, the coverage design used eight geographic strata, covering a range of population density. A stratified sample of 18 canvas areas was randomly selected from that frame to estimate the coverage rate of the licensure frame. The frame of canvas areas gives complete coverage of all tobacco outlets in the State, licensed or not. The 18 canvas areas covered all or part of 34 ZIP code areas in 9 counties. A total of 228 tobacco outlets were identified in the field canvassing for an average of 12.8 per canvas area.

Both weighted and un-weighted coverage rates are presented at the bottom of the Exhibit 1. The sampling weight for each outlet is based on the canvass-area selection probabilities and the two estimates are calculated as:

$$\text{Unweighted Rate} = \sum_{i=1}^{18} X_{Li} / \sum_{i=1}^{18} X_{Ci}$$

$$\text{Weighted Rate} = \sum_{i=1}^{18} W_i X_{Li} / \sum_{i=1}^{18} W_i X_{Ci}$$

Where  $X_{Li}$  and  $X_{Ci}$  are the outlet counts in canvass area  $i$  for the list and area frame, respectively, and  $W_i$  are sampling weights for area  $i$ .

Details for the coverage design and field methodology are in Design of Sampling Frame Coverage Study: Montana April 4, 2013. Recall from that design report, that the canvas areas were created as one or more ZIP areas or portions of ZIP areas (larger ZIPs were randomly sub-sampled to obtain a feasible canvas area—size being based on estimated number of tobacco outlets). The ZIP boundaries for field maps were created from DeLorme Street Atlas supplemented by mapping software used by the Montana field staff. Detailed information about all ZIP codes in a county was obtained from Melissadata.com, which lists all ZIP areas and the percent of the population of each ZIP area that is located within a county. For the nonurban stratum, counties were selected at the first stage to facilitate creating a frame of ZIP areas. All ZIP areas with 50 percent or more of their population in the selected counties were included in the frame for the county. (hence, all ZIP areas in MT had a chance of being selected for the coverage study).

The Montana list frame and Melissadata were used as a source for a size measure used to select ZIPs with probability proportional to size. The listed ZIPs that contained no known outlets were assigned a small size measure to ensure full coverage by the area sample.

<b>Exhibit 1. Coverage Study Results for MT 2013</b>					
<b>Canvass Area*</b>	<b>Stratum</b>	<b>Outlet Weights</b>	<b>Number of Outlets Identified Per Canvassing Area</b>	<b>Number of Matched Outlets on List Frame</b>	<b>Percentage of Outlets Found on List</b>
1.	1	5.66666	17	17	1.000
2.	1	5.66666	12	12	1.000
3.	1	5.66666	10	10	1.000
4.	2	3.66666	14	13	0.929
5.	2	3.66666	17	17	1.000
6.	2	3.66666	17	16	0.941
7.	3	3.66666	20	19	0.950
8	3	3.66666	15	14	0.933
9.	3	3.66666	10	10	1.000
10	4	8	9	9	1.000
11	4	8	9	8	0.889
12	5	11	11	11	1.000
13	5	11	17	16	0.941
14	6	12.7272	10	10	1.000
15	6	12.7272	10	9	0.900
16	7	18.7777	8	8	1.000
17	7	18.7777	10	10	1.000
18	8	10.4	12	12	1.000
<b>Un-weighted</b>			<b>228</b>	<b>221</b>	<b>0.969</b>
<b>Weighted**</b>			<b>1731.3</b>	<b>1685.0</b>	<b>0.973</b>

\*A canvas area may comprise a portion of, or groups of ZIP code areas depending on their estimated number of outlets.

\*\*using outlet weights, which are reciprocal of (the probability of county selection times conditional probability of selecting the canvass area within the county).